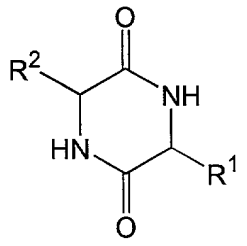
WE CLAIM:

1. A method of synthesizing a diketopiperazine of the formula:



wherein:

R^1 is $-CH_2COR^3$, or $-CH_2CH_2COR^3$;

R^2 is the side chain of an amino acid selected from the group consisting of glycine, alanine, valine, leucine, isoleucine, serine, threonine, aspartic acid, asparagine, glutamic acid, glutamine, lysine, hydroxylysine, histidine, arginine, phenylalanine, tyrosine, tryptophan, thyroxine, cysteine, methionine, norvaline and ornithine;

R^3 is -OH, $-NH_2$, $-OR^4$, $-NHR^4$, or $-NR^4R^4$; and

each R^4 is independently an alkyl, aryl, alkylaryl, or arylalkyl;

the method comprising:

(a) providing a first amino acid selected from the group consisting of glycine, alanine, valine, leucine, isoleucine, serine, threonine, aspartic acid, asparagine, glutamic acid, glutamine, lysine, hydroxylysine, histidine, arginine, phenylalanine, tyrosine, tryptophan, thyroxine, cysteine, methionine, norvaline and ornithine, the first amino acid optionally being protected with one or more protecting groups so as to prevent unwanted side reactions;

(b) reacting the first amino acid with a second amino acid derivative having one of the following formulas:

$NH_2CH(CH_2COOR^5)COOH$ or

$NH_2CH(CH_2CH_2COOR^5)COOH$,

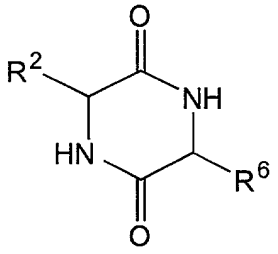
wherein:

R^5 is a lower alkyl or alkylaryl, and

the amino group or α-carboxyl of the second amino acid derivative is optionally protected with a protecting group so as to prevent unwanted side reactions,

the reaction taking place under conditions effective to form a dipeptide;

(c) cyclizing the dipeptide to form a diketopiperazine having the formula;



wherein:

R^6 is $-CH_2COOR^5$, or $-CH_2CH_2COOR^5$; and

(d) removing the R^5 group from the diketopiperazine to give a compound of formula **2** wherein R^3 is -OH.

2. The method of Claim 1 wherein the first amino acid is alanine.

3. The method of Claim 1 wherein R^5 is benzyl.

4. The method of Claim 2 wherein R^5 is benzyl.

5. The method of Claim 1 wherein the dipeptide is cyclized by heating it under neutral conditions.

6. The method of Claim 5 wherein dipeptide is refluxed in a neutral solvent.

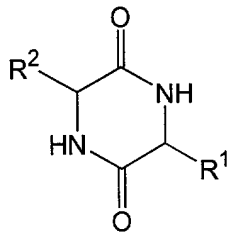
7. The method of Claim 6 wherein the neutral solvent is a combination of butan-2-ol and toluene.

8. The method of Claim 1 wherein the R^5 group is removed by hydrogenation of the diketopiperazine formed in step (c).

9. The method of Claim 8 wherein the diketopiperazine of step (c) is hydrogenated using a palladium on carbon catalyst.

10. The method of Claim 1 further comprising converting the product of step (d) to a compound of formula **2** wherein R^3 is other than -OH.

11. A method of synthesizing a diketopiperazine of the formula:



wherein:

R^1 is $-CH_2COR^3$, or $-CH_2CH_2COR^3$;

R^2 is the side chain of an amino acid selected from the group consisting of glycine, alanine, valine, leucine, isoleucine, serine, threonine, aspartic acid, asparagine, glutamic acid, glutamine, lysine, hydroxylysine, histidine, arginine, phenylalanine, tyrosine, tryptophan, thyroxine, cysteine, methionine, norvaline and ornithine;

R^3 is -OH, $-NH_2$, $-OR^4$, $-NHR^4$, or $-NR^4R^4$; and

each R^4 is independently an alkyl, aryl, alkylaryl, or arylalkyl;

the method comprising:

(a) attaching a first amino acid to a solid support, the first amino acid being selected from the group consisting of glycine, alanine, valine, leucine, isoleucine, serine, threonine, aspartic acid, asparagine, glutamic acid, glutamine, lysine, hydroxylysine, histidine, arginine, phenylalanine, tyrosine, tryptophan, thyroxine, cysteine, methionine, norvaline and ornithine, the first amino acid optionally being protected with one or more protecting groups so as to prevent unwanted side reactions;

(b) reacting the first amino acid attached to the solid support with a second amino acid derivative having one of the following two formulas:

$NH_2CH(CH_2COOR^5)COOH$ or

$NH_2CH(CH_2CH_2COOR^5)COOH$,

wherein:

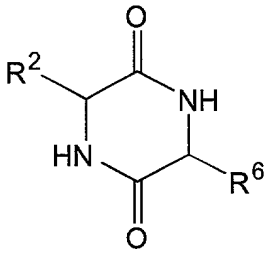
R^5 is a lower alkyl or alkylaryl, and

the amino group or α-carboxyl of the second amino acid derivative optionally being protected with a protecting group so as to prevent unwanted side reactions,

the reaction taking place under conditions effective to form a dipeptide attached to the solid support;

(c) removing the dipeptide from the solid support;

(d) cyclizing the dipeptide to form a diketopiperazine having the formula:



wherein:

R^6 is $-CH_2COOR^5$, or $-CH_2CH_2COOR^5$; and

(e) removing the R^5 group to give a compound of formula **2** wherein R^3 is -OH.

12. The method of Claim 11 wherein the first amino acid is alanine.

13. The method of Claim 11 wherein R^5 is benzyl.

14. The method of Claim 12 wherein R^5 is benzyl.

15. The method of Claim 11 wherein the dipeptide is cyclized by heating it under neutral conditions.

16. The method of Claim 15 wherein dipeptide is refluxed in a neutral solvent.

17. The method of Claim 16 wherein the neutral solvent is a combination of butan-2-ol and toluene.

18. The method of Claim 1 wherein the R^5 group is removed by hydrogenation of the diketopiperazine formed in step (d).

19. The method of Claim 18 wherein the diketopiperazine of step (d) is hydrogenated using a palladium on carbon catalyst.

20. The method of Claim 11 further comprising converting the product of step (e) to a compound of formula **2** wherein R^3 is other than -OH.